12-28-00 633 Rec'd PCT/PTO 26 DEC 2000

0-1390
3)

U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NUMBER
0886/01083

# TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US)

| INTERNATIONAL APPLICATION NO. | INTERNATIONAL FILING DATE | PRIORITY DATE CLAIMED |
|---|---|---|
| PCT/IL99/00090 | 11 FEBRUARY 1999 | 26 JUNE 1998 |

TITLE OF INVENTION
**SYSTEM AND METHOD FOR SHARING DOCUMENTS AMONG MULTIPLE PARTICIPANTS**

09/720682

APPLICANT(S) FOR DO/EO/US

**BLACKNELL, Paul W.; DENARO, Daniel P.**

Applicant herewith submits to the United States Designated/Elected office (DO/EO/US) the following items and other information:

1. [X] This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.

2. [] This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S. C. 371.

3. [] This is an express request to begin national examination procedures (35 U.S.C. 371 (f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S. C. 371 (b) and PCT Articles 22 and 39 (1).

4. [X] A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.

5. [X] A copy of the International Application as filed (35 U.S. C. 371 (c) (2) )
   a. [] is transmitted herewith (required only if not transmitted by the International Bureau).
   b. [X] has been transmitted by the International Bureau
   c. [] is not required, as the application was filed in the United States Receiving Office (RO/US)

6. [] A translation of the International Application into English (35 U.S. C. 371 (c)2)).

7. [] Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3))
   a. [] are transmitted herewith (required only if not transmitted by the International Bureau).
   b. [] have been transmitted by the International Bureau.
   c. [] have not been made; however, the time limit for making such amendments has NOT expired.
   d. [] have not been made and will not be made.

8. [] A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371 (c) (3)).

9. [X] An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)). (**Unsigned**)

10. [] A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).

**Items 11. to 16. below concern other document(s) or information included:**

11. [X] An Information Disclosure Statement under 37 CFR 1.97 and 1.98 (with references).

12. [] An assignment document for recording. A **separate** cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.

13. [] A FIRST preliminary amendment.
    [] A SECOND or SUBSEQUENT preliminary amendment.

14. [] A substitute specification.

15. [] A change of power of attorney an/or address letter.

16. [] Other items or information:

EXPRESS MAIL CERTIFICATE
Date 12/26/00 Label No. EL706718831US
I hereby certify that, on the date indicated above, this paper or fee was deposited with the U.S. Postal Service & that it was addressed for delivery to the Assistant Commissioner for Patents, Washington, DC 20231 by "Express Mail Post Office to Addressee" service.

D B Peek
Name (Print)

Signature

Unsi

| U[illegible]PLICATION NO. (if known, see 37 CFR 1.5(b)) 09/720682 | INTERNATIONAL APPLICATION NO. PCT/IL99/00090 | Attorney's Docket Number 0866/0I083 |
|---|---|---|

526 Rec'd PCT/PTO 26 DEC 2000

| 17. The following fees are submitted: | | CALCULATIONS | PTO USE ONLY |
|---|---|---|---|
| **Basic National Fee (37 CFR 1.492 (a)(1)-(5)):** Search Report has been prepared by the EPO [X] or JPO [] | $860.00 | | |
| International preliminary examination fee paid to USPTO (37 CFR 1.482) ..... | $690.00 | | |
| No international preliminary examination fee paid to USPTO(37 CFR 4.482) but international search fee paid to USPTO (37 CFR 1.445 (a) (2)... | $710.00 | | |
| Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO..... | $1000.00 | | |
| International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4)..... | $100.00 | | |
| ENTER APPROPRIATE BASIC FEE AMOUNT = | | $100.00 | |
| Surcharge of $130.00 for furnishing the oath or declaration later than []20 []30 months from the earliest claimed priority date (37 CFR 1.492(e)). | | $ | |

| Claims | Number Filed | Number Extra | Rate | | |
|---|---|---|---|---|---|
| Total Claims | 19-20 | 0 | 0 X $18.00 | $0 | |
| Independent Claims | 2-3 | 0 | 0 X $78.00 | $0 | |
| Multiple dependent claims(s) (if applicable) | | +260 | | $0 | |
| | | | TOTAL OF ABOVE CALCULATIONS = | $100.00 | |
| Reduction by 1/2 for filing by small entity, if applicable. Verified Small Entity statement must also be filed. (Note 37 CFR 1.9, 1.27, 1.28). | | | | $ | |
| | | | SUBTOTAL = | $100.00 | |
| Processing fee of $130.00 for furnishing the English translation later the [] 20 [] 39 months from the earliest claimed priority date (37 CFR 1.492(f)). | | | + | $ | |
| | | | TOTAL NATIONAL FEE = | $100.00 | |
| Fee for recording the enclosed assignment (37 CFR 1.21(h)). the assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). $40.00 per property | | | + | | |
| | | | TOTAL FEES ENCLOSED = | $100.00 | |
| | | | | Amount to be refunded | $ |
| | | | | charged | $ |

a. [X] A check in the amount of **$100.00** to cover the above fees is enclosed.

b. [] Please charge my Deposit Account No.04-0100 in the amount of $ to cover the above fees.

c. [X] The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 04-0100. A duplicate copy of this sheet is enclosed.

**NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.**

SEND ALL CORRESPONDENCE TO:
**John C. Todaro**
Darby & Darby P.C.
805 Third Avenue
New York, New York 10022-7513

SIGNATURE John C. Todaro

NAME **John C. Todaro**

REGISTRATION NO. **36,036**

# SYSTEM AND METHOD FOR SHARING DOCUMENTS AMONG MULTIPLE PARTICIPANTS

## FIELD OF THE INVENTION

The present invention relates to, but is not limited to, a method and system for sharing documents among multiple participants. More particularly, the present invention relates to a conferencing system and a method operative at a conferencing device for sharing documents during a conference.

## BACKGROUND OF THE INVENTION

Many computer-related applications involve the use of shared data files. For example, in a multimedia (audio, data, video, animation) conference application, a data file that includes a series of presentation slides may be transferred to computers used by the conference participants. Once transferred, the slides may be viewed by each of the participants. In some cases, the distributed data file may be edited by one or more of the participants.

In a typical on-line multi-party conference, a chairperson prepares a shared document (the conference document) that contains several data objects (data) such as Microsoft® PowerPoint® slides or Word® documents. At the beginning of the conference, the chairperson connects to the other participants via a data network. Once connected, the participants may interact with one another in conjunction with the shared conference document. Inherent in this approach is that the shared document needs to be transmitted to the conference participants. Typically, the chairperson transfers the document to the other participants at the beginning of the conference. In practice, the file transfer process may take several minutes. As a result, the meeting participants may be forced to wait for the file transfers to complete before collaborating with one another or the chairperson must start the data exchange process early. An example of such an application is Microsoft NetMeeting™.

Conventionally, it is not sufficient to simply to transfer the shared document, which contains the data objects to be exchanged by electronic mail, to the participants in advance. This is because the objects themselves may change if they are edited before the meeting starts. Electronic mail systems are also known in the art as e-mail. In view

of the above, a need exists for a file sharing method that reduces the amount of time that may be wasted transferring shared documents, but that also ensures that the participants in a conference are viewing the same versions of the data objects.

Additional problems arise in applications when multiple parties need to edit a shared document. In a Microsoft Windows® environment, documents may be shared and edited using objects based on Microsoft's Object Linking and Editing ("OLE") technology. This technique also may be used for documents that are shared by computers that are connected via data networks.

For example, in a real-time conference involving several participants, the originator of the conference may embed the object into a suitable container document and then send the container document to the to the participants. The object may then be edited by any of the participants. The edited object, in turn, may then be distributed to the other participants in the conference to update the object they are viewing to the current version.

This technique, however, often results in relatively long setup times when initiating the conference. In addition, relatively substantial data transfers may need to be made during the conference, i.e., large amounts of data may need to be distributed between the participants, whenever the objects are edited. In view of the above, a need exists for a method of sharing documents that reduces the quantity of data sent during setup and that reduces data traffic during editing sessions of shared objects.

## SUMMARY OF THE INVENTION

In the first aspect of the present invention there is provided a method for sharing data files among a multiple participants. Each of the participants has a conference station for sharing the data file in a conference. The method comprises the steps of routing a data file, which includes at least one data object, to each of the participants before the conference is commenced, assigning to each data object of the document an identifier for indicating the data object last modification, establishing a conference and distributing a list of data object identifications and the data objects which need to be modified during the conference among the participants. The method further comprises the steps of generating a shared document which comprises at least one data object associated with each participant, editing the at least one data object for providing an modified data object and distributing the modified data object among participants for updating the shared document associated with each participant.

Advantageously, the invention may significantly reduce conference setup time and provide a unique identifier and signature for each data file and object. Furthermore, the invention reduces the amount of data transferred among participants, hence, reduces the updating time associated with each shared document.

In the first embodiment of the invention, routing of the data file is performed by an electronic mail or file transfer protocol. In addition, the step of assigning further includes the steps of assigning a unique identifier for each data file and assigning a digital signature to each data object of the data file. In this manner, the digital signature is a time step for designating the last modification of the data object.

In the first aspect of the invention, the method further includes the step of creating a link from the data object at the shared document to the data file.

In the first embodiment of the invention, the step of editing further includes the step of requesting the data file from data file owner and editing the data object with an application which generates the data file at a requestor station for providing a modified data object which links to the shared document.

In the second aspect of the present invention there is provided a system having a plurality of conferencing stations operably coupled to at least one communication network, for sharing data files among a plurality of participants in a conference. The conferencing station includes a routing application for routing a data file that includes at

least one data object to each of the participants before the conference is commenced, an identification application for assigning to each data object of the document an identifier for indicating the data object's last modification, a conferencing application for establishing a conference and controlling the distribution of a list of data object identifications among the participants, an electronic whiteboard for viewing and editing a shared document, an editing application for editing the data file; a compressor for compressing modifications of the data file and a distribution application for distributing modifications of the data file among participants.

Preferably, the routing application is an electronic mail application and the at least one communication network is a packet switched network. In this embodiment, the conferencing station further includes a video and audio device for performing an audiovisual conference and a display monitor for viewing the conference information.

SUBSTITUTE SHEET (RULE 26)

## BRIEF DESCRIPTION OF THE DRAWINGS

These and other features of the invention will become apparent from the following detailed description of the preferred embodiments and the claims, taken with the accompanying drawings, wherein similar reference characters refer to similar elements throughout and in which:

FIG. 1 is a block diagram of one embodiment of a conferencing system constructed in accordance with the invention;

FIGS. 2A and 2B are a flowchart of one embodiment of a data sharing method in accordance with the invention;

FIG. 3 is a flowchart of another embodiment of a data sharing method in accordance with the invention;

FIG. 4 is a graphic illustration of an embedded method of data transfer; and

FIG. 5 is a graphic illustration of one embodiment of a document sharing method in accordance with the present invention.

SUBSTITUTE SHEET (RULE 26)

## DETAILED DESCRIPTION OF THE INVENTION

Referring firstly to FIG. 1, a conferencing system is shown. The conferencing system 1 includes several conference stations 2, 3, 4 that are connected via one or more data networks 5, 6 (the Internet 5, a local area network 6, etc.). Conference participants (not shown) use the conference stations 2, 3, 4 to communicate with other participants.

Each conference station may support audio, data, and graphical services using audio/video/data (A/V/D) equipment 8. For example, the conference participants may speak with one another using the station audio equipment 9. A participant may route documents to other participants to enable the participants to view the documents on the display device monitor 10 or electronic whiteboard 11 which is associated with the stations 2, 3, 4. In the preferred embodiment of the invention, a whiteboard 11 is used for viewing, editing and generating a shared document 15.

All conference stations 2, 3, 4 runs a number of applications for multi-party conferencing. The applications include (1) a conferencing application 12 which provides a user interface that facilitates establishing the conference and that enables a participant to route conference content information, e.g., documents, pictures, PowerPoint slides, to other participants, and (2) content editing/viewing application 13 that enable a participant to process the content information. For example, the content editing/viewing application may be a graphic-based editor such as Microsoft® PowerPoint® that enables a participant to edit graphical slides that are used in conjunction with the conference application 12 or whiteboard 11.

Each conference station 2, 3, 4 further includes a data memory 14, for storing a shared document 15, data files 16 and a presentation data 17. Each shared document 15 includes a globally unique identifier (GUID) 23, signature 24, and at least one data object 18 which includes a GUID 19 and signatures 20.

To reduce the complexity of FIG. 1, only a portion of the details of the stations 2, 3, 4 are illustrated. In addition, the details shown for a given conference station 2 might not be shown for all of the stations 3, 4. It should be understood, however, that, in general, similar functionality is provided by each of the conference stations 2, 3, 4.

In accordance with one embodiment of the invention, the conferencing application 12 includes a digital routing means (not shown) which enables a participant to efficiently distribute the shared document 15 to other participants before the



SUBSTITUTE SHEET (RULE 26)

The PC includes a microphone for inputting voice to the conferencing application, a video camera for capturing images, a sound card, a video card and a communication device such as Ethernet card or a modem for distributing the shared document 15 among the participants (which is marked as A/V/D equipment 8).

Referring now to figs. 2A, 2B and 3, the above operations will now be discussed in more detail. FIGS 2A and 2B depict a flowchart of operation that may be performed in a conferencing system 1 implemented in accordance with the first embodiment of the invention described above. In several of the examples below, it is assumed that the conference chairperson establishes the conference and generates and distributes the shared document 15 that is used during the conference. It should be understood, however, that other conference participants might perform these acts. It should also be understood that, in general, any of the participants may perform caller and callee operations described in Figs. 2A and 2B.

Referring first to Fig. 2A, a method for marking and distributing shared document 15 before the conferences is shown. Initially, the caller starts conferencing application 12, for example, VocalTec Communication Client™, of VocalTec® Communications Israel (step 30). Next, the caller adds data objects 18 such as PowerPoint® slides of Microsoft®, USA, to the shared document 15 (step 31). The caller annotates the shared document 15 (step 32). The caller annotating all data objects 18 associated with the shared document 15 that need to be annotated (step 33). In the next step, the caller saves the shared document 15 in storage means such as a hard drive, floppy disk or memory 14 (step 34), and sends the shared document 15 to a callee (step 35). The callee receives the shared document 15 (step 40) and opens the shared document 15 (step 41). If the callee wishes to change the document 15 (steps 36 o42), then the callee annotates the data object 18 in the shared document 15 (steps 37 or 43) and continues annotating/adding/changing data object 18 until there is nothing remaining to change ( step 38). The callee then saves the document to the hard drive (steps 39 and 44).

Initially, the conference chairperson generates the content information to be used during the conference and stores the information in a data memory 14 such as a hard disk drive. This information may consist of various text or graphic files. For example, the content information may consist of a document generated using Microsoft Word®, a

signature 24 may be assigned when any of its objects 18 are modified (regenerated, edited, deleted) and any object signature 20 may be modified when the object 18 is edited. In one embodiment, the signature 20 consists of a timestamp that indicates the time at which an object was last modified.

Referring now to FIG. 2B, the chairperson establishes the conference by invoking the mechanism by which the participants perform data network conferencing, the techniques of which are known in the art.

For example, a conferencing application such a VocalTec Communication Client™ sold by VocalTec® communications Ltd. of Israel, may provide conferencing over a data network using virtual conference rooms established on public or private network servers. The teachings of the present invention may be integrated into a conferencing application such as the one described above in order to improve the performance of the application.

The flowchart of Fig. 2B will now be described in more detail. The conference starts (step 50) by the caller sending a GUID 23 and a signature 24 of the shared document 15 to each participant (step 51). If the caller has a newer object than the callee (step 52), then the caller sends a list of object signatures to the callee (step 53 and step 54), the callee receives a new copy of object 18 (step 55). A check is done for each data object (steps 56 to 54). The next step (step 57) the callee checks if he has newer data objects than the caller. If the callee has a newer data object than the caller, the callee sends a list of data object signatures to the caller (step 58). The callee performs the operation of checking and updating signatures (steps 58 to 61) until there are no data objects to update. The conference then continues (step 62).

In summary, once the conference is established, the participant who generated the content information (e.g., shared document) sends a list of identifiers (e.g., the GUIDs of the documents and/or objects) and signatures (e.g., the timestamps of the documents and/or objects) to the other participants. Each participant (e.g., the conferencing application running on the participant's conference station) may then check to see whether the document/object version of that participant's shared document matches the document/object persons on the list. If the version does not match (e.g. an object has been changed or a new object was added after the document was sent), the participant than requests a new copy of the object. In one embodiment, the

the original document. The editing is done by the application which first created the document.

In summery, the document that needed to be shared among multi participants is stored at the chairperson computer or other participant computer. The chairperson generates a shared document 15 on the whiteboard 11 that functions as the editing/viewing tool of the conferencing application 12, calling the other participants and distributing the shared document 15 to the other participants. The shared document 15 includes only the presentation data 21 that is linked to the original document. Each modification that is done by the chairperson is distributed to each participant for updating their copies of the shared document which is viewed on their whiteboard. Editing of the presentation data is done by the editor that created the presentation data. Editing additional information to the shared documents such as instructions, pointing on a paragraph, etc. can be done with the whiteboard 11 by each participant. Editing the presentation data requires the original file and the application that created it.

A detailed description of the flowchart of FIG. 3 will now be given. The conference is established by connecting a group of conference participants that are designated as USERS A, B, C and D (step 70). This may be accomplished in a similar manner as discussed hereinabove.

A participant, e.g., USER A, establishes a link to the shared document 15 that is to be distributed to the other participants during the conference (step 71). That is, USER A places the document into the viewing/editing application container using linked presentation data only.

USER A then sends the presentation data 21 to the other participants (step 72). As illustrated in FIG. 1, a copy of the presentation data 21 may be stored in the data memory 14 in each participant's station 2, 3, 4. The participants may then view the shared document 15 on their conference stations using the whiteboard 11 (step 73).

In one embodiment, the conferencing application may accomplish the above by intercepting the 'paste' operation that USER A performs when she/he inserts objects into the shared document 15. The conferencing application 12 compresses the presentation data 21 and then automatically sends the presentation data 21 to the other participants in the conference in real-time over the network. Each participant may then store a copy of the presentation data 21, as illustrated for conferencing station B 3.

At any time during the course of the conference, as designated by the dashed line in FIG. 3, a participant, e.g. USER B, may choose to edit the shared document 15 (step 74). If the data file 22 is not available to USER B (step 75) the data file 22 will be transferred on demand from USER A to USER B and will be stored on USER B's station (step 76). Next, the received file is linked to the original presentation data 21. The participant is then free to edit the document using a corresponding compatible content editing/viewing application 13 such as PowerPoint that is installed on her/his conference station (step 77).

As illustrated in FIG. 3, different portions of the resulting modified file may be sent to different participants. The updated data file is sent back to the originator of the file (e.g., USER A) (steps 78 and 79). Then, the originator updates the original file and its presentation object (step 80). The remaining participants (e.g., USERS C and D), are only sent updates of the presentation data (steps 81 and 82). The conferencing applications on the recipient terminals then automatically update the shared document 15 (step 83). This may be accomplished, for example, by sending GUIDs 23 with the presentation data 21 or data file 22, keeping track of which GUIDs 23 are currently being displayed and updating the whiteboard 11 accordingly.

In practice, the presentation data 21 may consist have ten times less data than the data file 22 that includes the total embedded file information. Thus, it may be seen that a system or method implemented according to this embodiment of the present invention may be significantly more efficient than conventional document sharing methods. In addition to the efficiencies that may be obtained using all of the above described techniques, significant efficiencies may be obtained by using only one of these techniques, for example, sending the deltas of the updates between the participants. Moreover, all data files and objects are compressed before being transferring among the participants. Thus, additionally reducing the amount of data that is transferred among the participants.

FIGS. 4 and 5 illustrate the advantages that may be realized through the use of this embodiment of the invention. FIG. 4 illustrates data flow using an embedded method for sharing and editing documents. Here, USER A inserts an embedded object 100, USER B edits the document 101, then the documents are updated for all of the

At any time during the course of the conference, as designated by the dashed line in FIG. 3, a participant, e.g. USER B, may choose to edit the shared document 15 (step 74). If the data file 22 is not available to USER B (step 75) the data file 22 will be transferred on demand from USER A to USER B and will be stored on USER B's station (step 76). Next, the received file is linked to the original presentation data 21. The participant is then free to edit the document using a corresponding compatible content editing/viewing application 13 such as PowerPoint that is installed on her/his conference station (step 77).

As illustrated in FIG. 3, different portions of the resulting modified file may be sent to different participants. The updated data file is sent back to the originator of the file (e.g., USER A) (steps 78 and 79). Then, the originator updates the original file and its presentation object (step 80). The remaining participants (e.g., USERS C and D), are only sent updates of the presentation data (steps 81 and 82). The conferencing applications on the recipient terminals then automatically update the shared document 15 (step 83). This may be accomplished, for example, by sending GUIDs 23 with the presentation data 21 or data file 22, keeping track of which GUIDs 23 are currently being displayed and updating the whiteboard 11 accordingly.

In practice, the presentation data 21 may consist have ten times less data than the data file 22 that includes the total embedded file information. Thus, it may be seen that a system or method implemented according to this embodiment of the present invention may be significantly more efficient than conventional document sharing methods. In addition to the efficiencies that may be obtained using all of the above described techniques, significant efficiencies may be obtained by using only one of these techniques, for example, sending the deltas of the updates between the participants. Moreover, all data files and objects are compressed before being transferring among the participants. Thus, additionally reducing the amount of data that is transferred among the participants.

FIGS. 4 and 5 illustrate the advantages that may be realized through the use of this embodiment of the invention. FIG. 4 illustrates data flow using an embedded method for sharing and editing documents. Here, USER A inserts an embedded object 100, USER B edits the document 101, then the documents are updated for all of the

participants, USER C 102 and USER D 103 as is illustrated by arrow lines and dotted lines in FIG. 4.

FIG. 5 illustrates a linked method implemented in accordance with the present invention. In accordance with the method, USER A inserts an object via a link 200, the file is then sent to USER B after USER B requests to edit the file 201, then all of the participants are updated, USER C 203 and USER D 204. The solid lines indicate data transfers before any editing occurs. The dotted lines represent data flows after USER B has edited the document. Note that this example assumes that the presentation data is 1/10 the size of the embedded data and that subsequent deltas are 1/10 the original size of either the embedded data or the presentation data.

Table 1 presented below summarizes the data flow in each case.

Table 1

| | Embedded Data Method (Figure 4) Total Data Sent (Kbytes) | Fast Linked Method (Figure 5) Total Data Sent (Kbytes) |
|---|---|---|
| Setup Data | 300 | 30 |
| B Edits | 330 | 142 |
| B + C Edits | 360 | 254 |
| B + C + D Edits | 390 | 366 |

It may be seen that the method of the invention can significantly reduce the total data transmitted over the networks, particularly when less than all of the members of the conference desire to edit a particular document. In particular, data sent during the conference setup may be dramatically reduced. In addition, data transmission during an edit session may be more efficient. Thus, the invention provides faster setup and editing time, particularly on relatively slow data networks.

Data compression techniques such as loss less compression techniques, for example, PKZIP or ARJ, may also be used to further reduce the amount of data that is transferred for the conference. For example, the data may be compressed when the changes for the presentation of the full object are being sent.

While the invention has been described with respect to a limited number of embodiments, it will be appreciated that many variations, modifications and other applications of the invention may be made.

## CLAIMS

1. A method for sharing data files among a multiple participants wherein each participant has a conference station for sharing said data file in a conference, said method comprising the steps of:

routing a data file that includes at least one data object to each one of the participants before the conference is commenced;

assigning to each data object of said document an identifier for indicating the last modification of said data object;

establishing a conference and distributing a list of data object identifications among said participants and the data objects which need to be modified during said conference;

generating a shared document that comprises at least one data object at each participant;

editing said at least one data object for providing a modified data object; and

distributing the modified data object among said participants for updating said shared document of each participants.

2. The method according to claim 1, wherein said step of routing comprises the step of routing said data file by digital routing means.

3. The method according to claim 2 wherein said digital routing means comprises a file transfer protocol.

4. The method according to claim 2, wherein said digital routing means comprises electronic mail.

5. The method according to claim 1, wherein said step of assigning further comprises the steps of:

assigning a unique identifier for each data file; and

assigning a digital signature to each data object within said data file.

6. The method according to claim 5, wherein said digital signature is a time step for designating the last modification of said data object.



SUBSTITUTE SHEET (RULE 26)

7. The method according to claim 1, further comprising the steps of:

assigning an identifier for each modification of said data file once said conference has commenced;

requesting a modified list of identifiers; and

distributing said modified list of identifiers to said requestor.

8. The method according to claim 7, wherein said step of assigning further comprises the step of assigning a digital signature for each said data object of said data file which was modified.

9. The method according to claim 1, wherein the step of generating further comprises the step of creating a link from said data object at said shared document to said data file.

10. The method according to claim 1, wherein the step of editing further comprises the steps of:

requesting said data file from the data file owner; and

editing said data object with an application which functions to generate said data file at a requestor station for providing a modified data object linked to said shared document.

11. The method according to claim 10, wherein said data object comprises presentation data.

12. A method for modifying a shared document during a conference comprising a plurality of participants, said shared document including presentation data and a data file which comprises information associated with said presentation data, the method comprising the steps of:

marking said data file and said presentation data;

routing said presentation data to each participant before the conference commences;

establishing a conference and subsequently distributing said presentation data among said participants;

generating said shared document that comprises said presentation data that is linked to said data file;

distributing said data file to a participant who requested to edit said shared document;

editing the presentation data at said data file for providing modified presentation data;

distributing said modified presentation data among said plurality of participants; and

updating said shared document file in accordance with said editing modification.

13. The method according to claim 12, wherein the step of linking said presentation data with said data file is performed via means of object linking and editing (OLE).

14. The method according to claim 13, further comprising the steps of:

comparing presentation data among said participants for generating a file that includes modifications of said presentation data;

compressing said file; and

distributing said file among said participants.

15. A system having a plurality of conferencing stations operably coupled to at least one communication network, said system for sharing data files among a plurality of participants in a conference, wherein said conferencing station comprises:

a routing application for routing a data file which includes at least one data object to each said participant before the conference is commenced;

an identification application for assigning to each data object of said document an identifier for indicating the last modification of said data object;

a conferencing application for establishing a conference and controlling distribution of a list of data object identifications among said participants;

an electronic whiteboard for viewing and editing a shared document;

an editing application for editing said data file;

a compressor for compressing modifications of said data file; and

a distribution application for distributing modifications of said data file among said plurality of participants.

16. The system according to claim 15, wherein said routing application comprises an electronic mail application.

17. The system according to claim 15, wherein said routing application comprises file transfer protocol.

18. The system according to claim 15, wherein said at least one communication network comprises a packet switched network.

19. The system according to claim 15, wherein said at least one communication network comprises a local area network.

14-07-2000 09:25:26 972 2 6755555 P.18

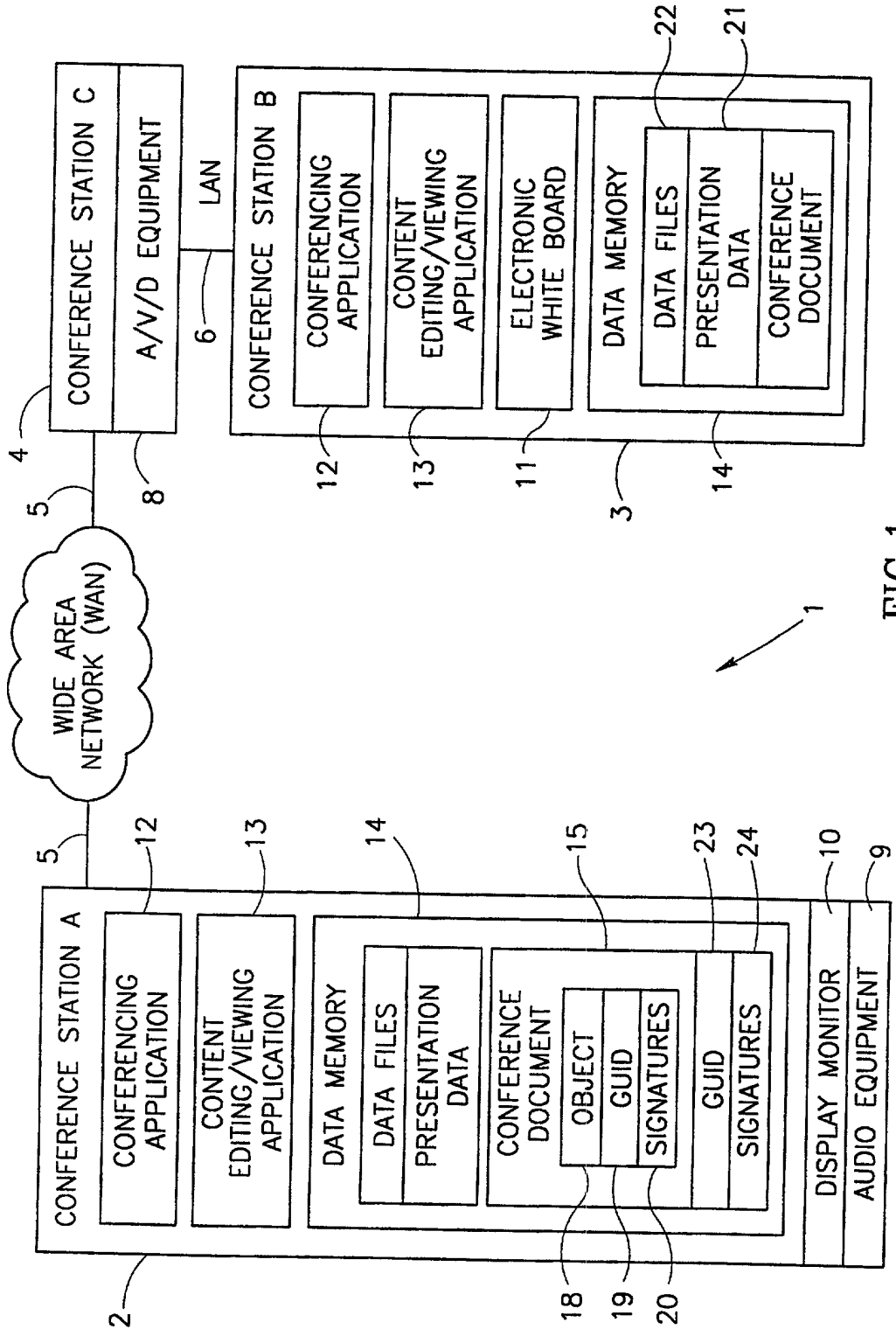

CONFERENCE STATION A
CONFERENCING APPLICATION
CONTENT EDITING/VIEWING APPLICATION
DATA MEMORY
DATA FILES
PRESENTATION DATA
CONFERENCE DOCUMENT
OBJECT
GUID
SIGNATURES
GUID
SIGNATURES
DISPLAY MONITOR
AUDIO EQUIPMENT
WIDE AREA NETWORK (WAN)
CONFERENCE STATION C
A/V/D EQUIPMENT
LAN
CONFERENCE STATION B
CONFERENCING APPLICATION
CONTENT EDITING/VIEWING APPLICATION
ELECTRONIC WHITE BOARD
DATA MEMORY
DATA FILES
PRESENTATION DATA
CONFERENCE DOCUMENT
1
2
3
4
5
6
8
9
10
11
12
13
14
15
18
19
20
21
22
23
24

FIG. 1

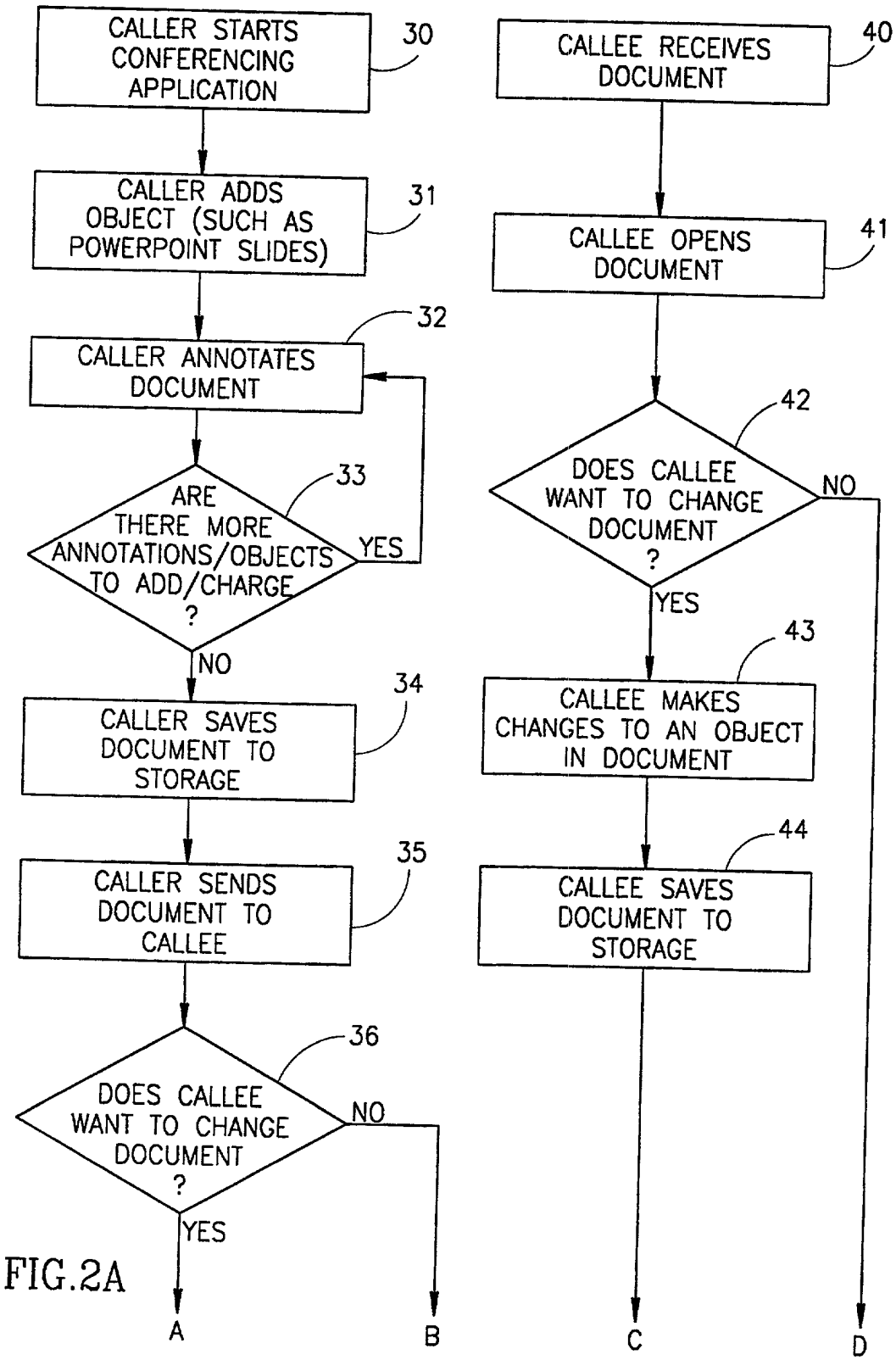

CALLER STARTS CONFERENCING APPLICATION
30
CALLER ADDS OBJECT (SUCH AS POWERPOINT SLIDES)
31
CALLER ANNOTATES DOCUMENT
32
ARE THERE MORE ANNOTATIONS/OBJECTS TO ADD/CHARGE ?
33
YES
NO
CALLER SAVES DOCUMENT TO STORAGE
34
CALLER SENDS DOCUMENT TO CALLEE
35
DOES CALLEE WANT TO CHANGE DOCUMENT ?
36
NO
YES
A
B
CALLEE RECEIVES DOCUMENT
40
CALLEE OPENS DOCUMENT
41
DOES CALLEE WANT TO CHANGE DOCUMENT ?
42
NO
YES
CALLEE MAKES CHANGES TO AN OBJECT IN DOCUMENT
43
CALLEE SAVES DOCUMENT TO STORAGE
44
C
D

FIG.2A

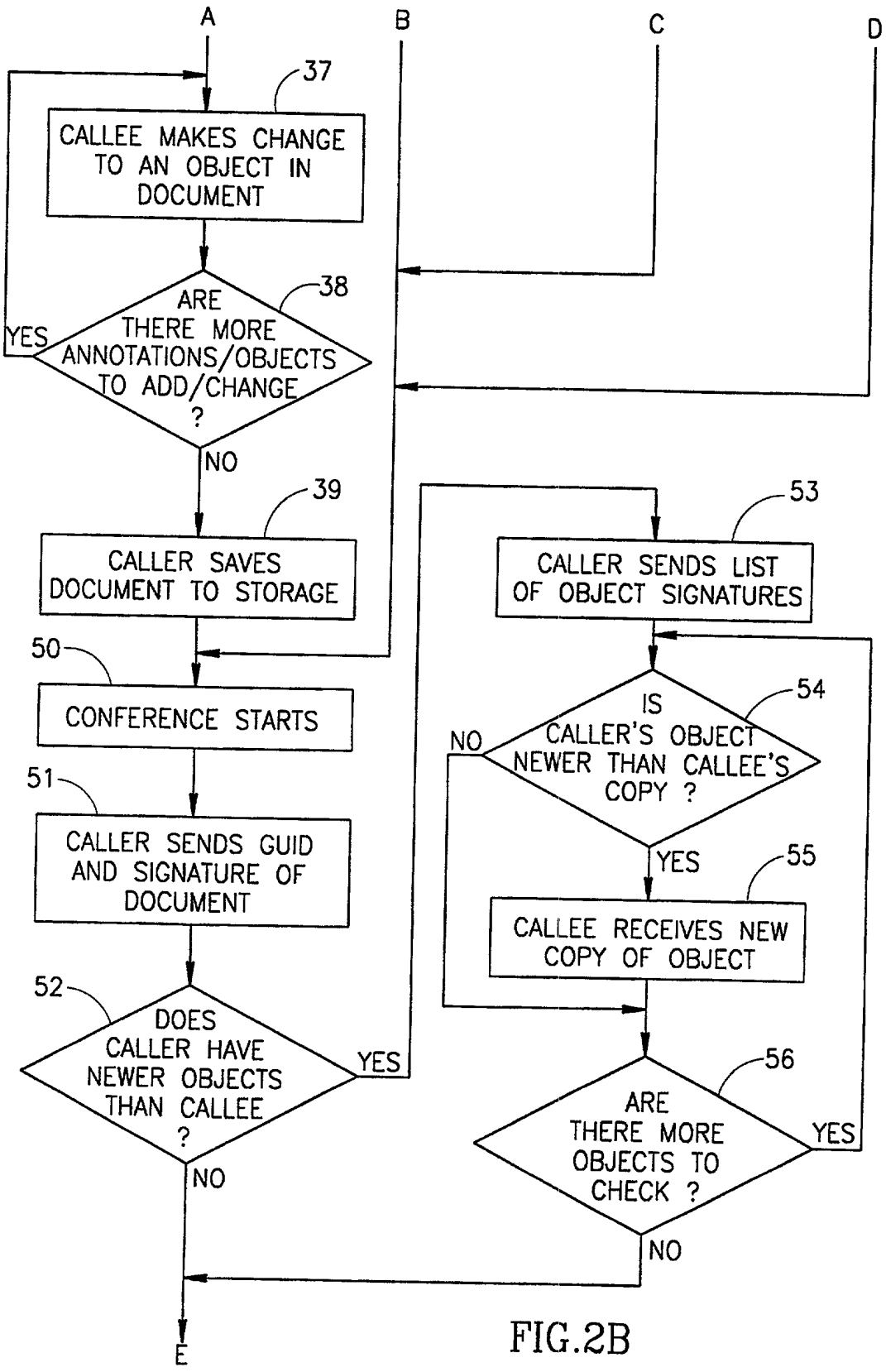

A
B
C
D
37
CALLEE MAKES CHANGE TO AN OBJECT IN DOCUMENT
38
ARE THERE MORE ANNOTATIONS/OBJECTS TO ADD/CHANGE ?
YES
NO
39
CALLER SAVES DOCUMENT TO STORAGE
50
CONFERENCE STARTS
51
CALLER SENDS GUID AND SIGNATURE OF DOCUMENT
52
DOES CALLER HAVE NEWER OBJECTS THAN CALLEE ?
YES
NO
E
53
CALLER SENDS LIST OF OBJECT SIGNATURES
54
IS CALLER'S OBJECT NEWER THAN CALLEE'S COPY ?
NO
YES
55
CALLEE RECEIVES NEW COPY OF OBJECT
56
ARE THERE MORE OBJECTS TO CHECK ?
YES
NO

FIG.2B

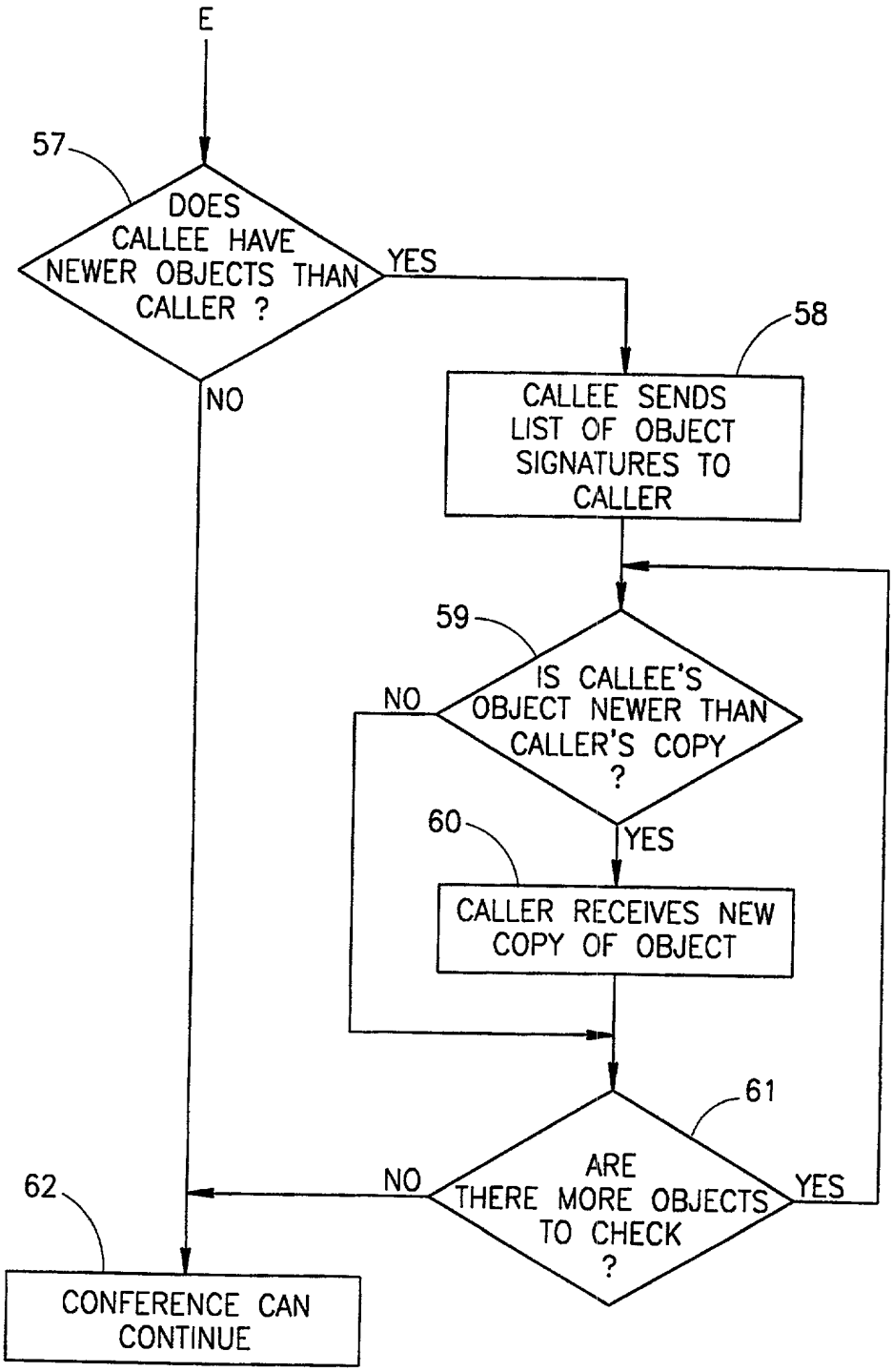

E
57
DOES CALLEE HAVE NEWER OBJECTS THAN CALLER ?
YES
NO
58
CALLEE SENDS LIST OF OBJECT SIGNATURES TO CALLER
59
IS CALLEE'S OBJECT NEWER THAN CALLER'S COPY ?
NO
YES
60
CALLER RECEIVES NEW COPY OF OBJECT
61
ARE THERE MORE OBJECTS TO CHECK ?
NO
YES
62
CONFERENCE CAN CONTINUE

FIG.2C

5/7

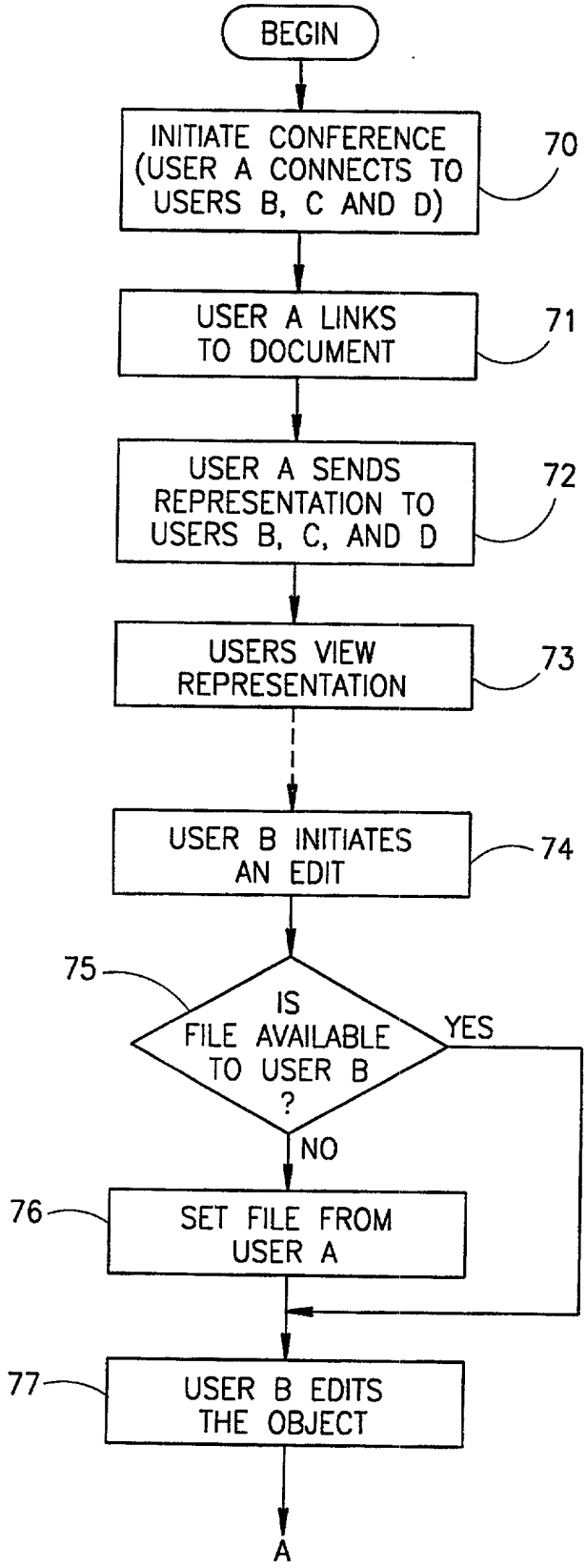



FIG.3A

SUBSTITUTE SHEET (RULE 26)

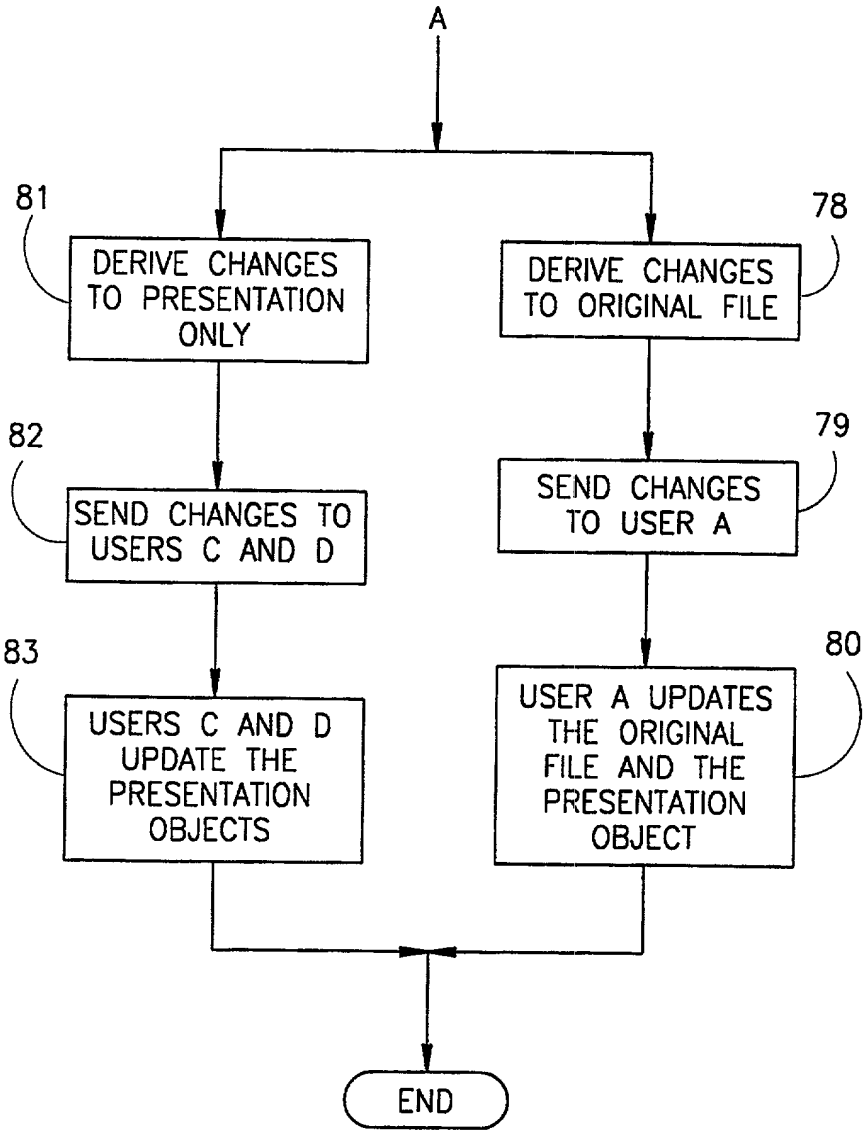
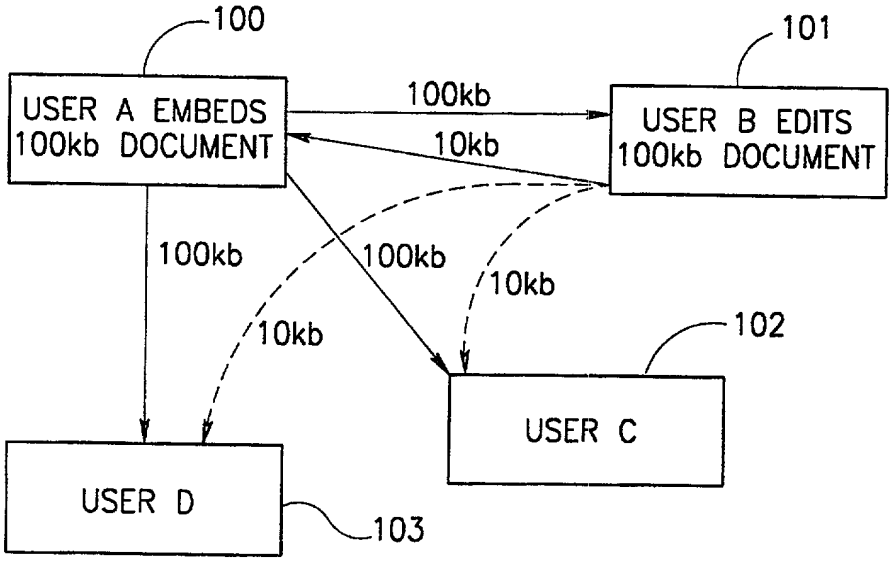
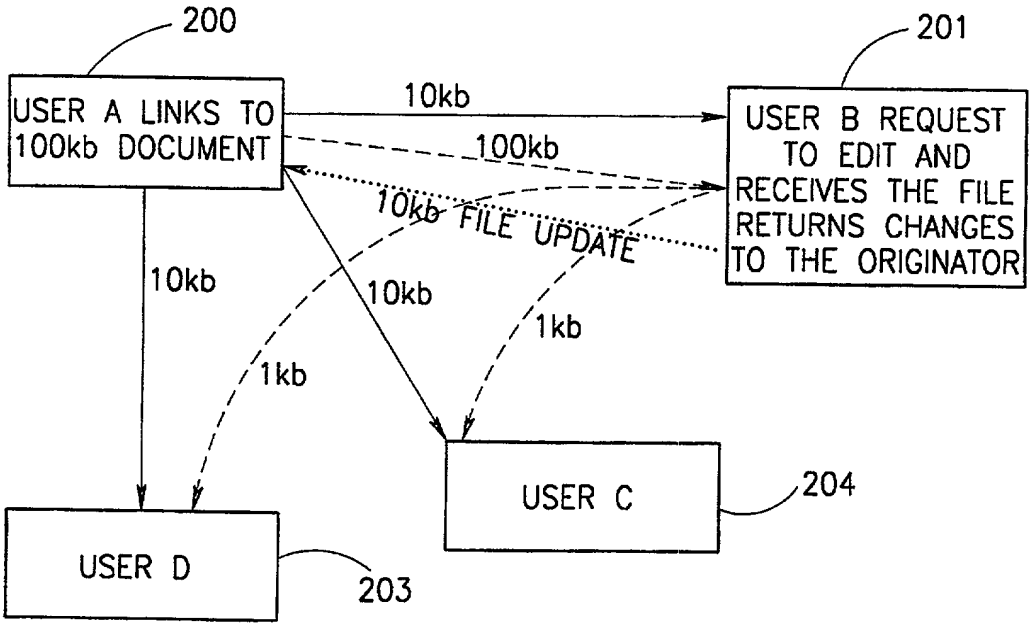

A
81
DERIVE CHANGES TO PRESENTATION ONLY
78
DERIVE CHANGES TO ORIGINAL FILE
82
SEND CHANGES TO USERS C AND D
79
SEND CHANGES TO USER A
83
USERS C AND D UPDATE THE PRESENTATION OBJECTS
80
USER A UPDATES THE ORIGINAL FILE AND THE PRESENTATION OBJECT
END

FIG.3B


100
101
USER A EMBEDS 100kb DOCUMENT
100kb
10kb
USER B EDITS 100kb DOCUMENT
100kb
100kb
10kb
10kb
102
USER C
USER D
103

FIG,4


200
201
USER A LINKS TO 100kb DOCUMENT
10kb
100kb
USER B REQUEST TO EDIT AND RECEIVES THE FILE RETURNS CHANGES TO THE ORIGINATOR
10kb FILE UPDATE
10kb
10kb
1kb
1kb
USER C
204
USER D
203

FIG,5

# COMBINED DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY

(Includes Reference to PCT International Applications)

ATTORNEY DOCKET NUMBER
0866/01083

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed for and which a patent is sought on the invention entitled:

SYSTEM AND METHOD FOR SHARING DOCUMENTS AMONG MULTIPLE PARTICIPANTS

the specification of which (check only one item below):

[] is attached hereto.

[] was filed as United States application

Serial No. _____

on _____

and was amended

on _____ (if applicable).

[X] was filed as PCT international application

Number PCT/IL99/00090

on February 11, 1999

and was amended under PCT Article 19

on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed:

**PRIOR FOREIGN/PCT APPLICATION(S) AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. 119:**

| COUNTRY (if PCT indicate PCT) | APPLICATION NUMBER | DATE OF FILING (day, month, year) | PRIORITY CLAIMED UNDER 35 U.S.C. 119 |
|---|---|---|---|
| | | | [] YES []NO |
| | | | [] YES [] NO |
| | | | [] YES [] NO |
| | | | [] YES [] NO |
| | | | [] YES [] NO |

US

**Combined Declaration for Patent Application and Power of Attorney (Continued)**
(Includes Reference to PCT International Applications)

ATTY'S DOCKET NUMBER
0866/01083

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) or PCT international application(s) designating the United States of America that is/are listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in that/those prior application(s) in the manner provided by the first paragraph of Title 35, United States Code §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1 56(a) which occurred between the filing date of the prior application(s) and the national or PCT international filing date of this application:

**PRIOR U.S. APPLICATIONS OR PCT INTERNATIONAL APPLICATIONS DESIGNATING THE U.S. FOR BENEFIT UNDER 35 U.S.C. 120:**

| U.S APPLICATIONS | | STATUS (Check one) | | |
|---|---|---|---|---|
| U.S APPLICATION NUMBER | U S FILING DATE | PATENTED | PENDING | ABANDONED |
| 60/090,710 | June 26, 1998 | | | |
| | | | | |
| | | | | |

**PCT APPLICATIONS DESIGNATING THE U.S.**

| PCT APPLICATION NO | PCT FILING DATE | U S SERIAL NUMBER ASSIGNED (if any) | | | |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |

**POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agents to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. Morris Relson #15,108, Gordon D. Coplein #19,165, William F. Dudine, Jr. #20,569, Michael J. Sweedler #19,937, S. Peter Ludwig #25,351, Paul Fields #20,298, Joseph B. Lerch #26,936, Melvin C. Garner #26,272, Ethan Horwitz #27,646, Beverly B. Goodwin #28,417, Adda C. Gogoris #29,714, Martin E. Goldstein #20,869, Bert J. Lewen 19,407, Henry Sternberg #22,408, Peter C. Schechter #31,662, Robert Schaffer #31,194,Robert C. Sullivan, Jr. #30,499, Joseph R. Robinson #33,448, and John C. Todaro #36,036**

**Send Correspondence to:**

DARBY & DARBY P.C.
805 Third Avenue
New York, New York 10022-7513

**Direct Telephone Calls to:**
(name and telephone number)

(212) 527-7700
John C. Todaro

| | | | | |
|---|---|---|---|---|
| 2 | FULL NAME OF INVENTOR | FAMILY NAME<br>BLACKNELL | FIRST GIVEN NAME<br>Paul | SECOND GIVEN NAME<br>Winfield |
| 0 | RESIDENCE & CITIZENSHIP | CITY<br>Surrey | STATE OR FOREIGN COUNTRY<br>Great Britain | COUNTRY OF CITIZENSHIP<br>Great Britain |
| 1 | POST OFFICE ADDRESS | POST OFFICE ADDRESS<br>Sandalwood, 2 Waverly Lane, Farnham | CITY<br>Surrey GU9 8BQ | STATE & ZIP CODE/COUNTRY<br>Great Britain |
| 2 | FULL NAME OF INVENTOR | FAMILY NAME<br>DENARO | FIRST GIVEN NAME<br>Daniel | SECOND GIVEN NAME<br>Peter |
| 0 | RESIDENCE & CITIZENSHIP | CITY<br>Hampshire | STATE OR FOREIGN COUNTRY<br>Great Britain | COUNTRY OF CITIZENSHIP<br>Australia |
| 2 | POST OFFICE ADDRESS | POST OFFICE ADDRESS<br>Charding House, Cowfold Lane, Rotherwick | CITY<br>Hampshire RG27, 9BP | STATE & ZIP CODE/COUNTRY<br>Great Britain |

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patents issuing thereon.

| SIGNATURE OF INVENTOR 201 | SIGNATURE OF INVENTOR 202 | |
|---|---|---|
| DATE | DATE | |



M:\0866\01083\TJH0355.WPD

| COMBINED DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY<br>(Includes Reference to PCT International Application) | ATTORNEY DOCKET NUMBER<br>0866/01083 |
|---|---|

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed for and which a patent is sought on the invention entitled:

SYSTEM AND METHOD FOR SHARING DOCUMENTS AMONG MULTIPLE PARTICIPANTS

the specification of which (check only one item below):

[] is attached hereto.

[] was filed as United States application

Serial No. _____

on _____

and was amended

on _____ (if applicable).

[X] was filed as PCT international application

Number PCT/IL99/00090

on February 11, 1999

and was amended under PCT Article 19

on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed:

**PRIOR FOREIGN/PCT APPLICATION(S) AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. 119:**

| COUNTRY<br>(If PCT indicate PCT) | APPLICATION NUMBER | DATE OF FILING<br>(day, month, year) | PRIORITY CLAIMED UNDER 35 U.S.C. 119 | |
|---|---|---|---|---|
| | | | [] YES | [] NO |
| | | | [] YES | [] NO |
| | | | [] YES | [] NO |
| | | | [] YES | [] NO |
| | | | [] YES | [] NO |

Combined Declaration for Patent Application and Power of Attorney (Continued)
Includes Reference to PCT International Applications

ATTY'S DOCKET NUMBER 0568/01683

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) or PCT international application(s) designating the United States of America that is/are listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in that/those prior application(s) in the manner provided by the first paragraph of Title 35, United States Code §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application(s) and the national or PCT international filing date of this application:

**PRIOR U.S. APPLICATIONS OR PCT INTERNATIONAL APPLICATIONS DESIGNATING THE U.S. FOR BENEFIT UNDER 35 U.S.C. 120:**

| U.S APPLICATIONS | | STATUS (Check one) | | |
|---|---|---|---|---|
| U.S APPLICATION NUMBER | U.S. FILING DATE | PATENTED | PENDING | ABANDONED |
| 60/090,710 | June 28, 1998 | | | |
| | | | | |
| | | | | |

| PCT APPLICATIONS DESIGNATING THE U.S. | | | | | |
|---|---|---|---|---|---|
| PCT APPLICATION NO. | PCT FILING DATE | U.S SERIAL NUMBER ASSIGNED (if any) | | | |
| | | | | | |
| | | | | | |
| | | | | | |

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. Mario Raicon #15,105, Gordon D. Cornell #19,169, William F. Dudine, Jr. #20,569, Michael J. Sweedler #19,837, S. Peter Ludwig #25,351, Paul Fields #20,298, Joseph B. Lerch #26,936, Melvin C. Garner #26,272, Ethan Horwitz #27,646, Beverly B. Goodwin #28,417, Adda C. Gogorik #29,714, Martin E. Goldstein #20,869, Bart J. Lewon 19,447, Henry Steinberg #22,408, Peter C. Schechter #31,662, Robert Schaffer #31,196, Robert C. Sullivan, Jr. #30,499, Joseph R. Robinson #33,448, and John C. Todaro #36,036

Send Correspondence to:

DARBY & DARBY P.C.
805 Third Avenue
New York, New York 10022-7513

Direct Telephone Calls to:
(name and telephone number)

(212) 527-7700
John C. Todaro

| | | | | |
|---|---|---|---|---|
| 2 | FULL NAME OF INVENTOR | FAMILY NAME: BLACKNELL | FIRST GIVEN NAME: Paul | SECOND GIVEN NAME: Winfield |
| 0 | RESIDENCE & CITIZENSHIP | CITY: Surrey | STATE OR FOREIGN COUNTRY: Great Britain GB3 | COUNTRY OF CITIZENSHIP: Great Britain |
| 1 | POST OFFICE ADDRESS | POST OFFICE ADDRESS: Sandalwood, 2 Waverly Lane, Farnham | CITY: Surrey GU9 8BQ | STATE OR COUNTRY: Great Britain |
| 2 | FULL NAME OF INVENTOR | FAMILY NAME: DENARO | FIRST GIVEN NAME: Daniel | SECOND GIVEN NAME: Peter |
| 0 | RESIDENCE & CITIZENSHIP | CITY: Hook | STATE OR FOREIGN COUNTRY: Great Britain GB3 | COUNTRY OF CITIZENSHIP: Australia |
| 2 | POST OFFICE ADDRESS | POST OFFICE ADDRESS: 36 Quince Tree Way | CITY: Hook RG27 9SG | STATE OR COUNTRY: Great Britain |

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

| SIGNATURE OF INVENTOR 201 | | SIGNATURE OF INVENTOR 202 | |
|---|---|---|---|
| Paul Blacknell | X | | X |
| DATE 11/7/2001 | X | DATE 26/7/2001 | X |